

# E.W. Howell Co., LLC

113 Crossways Park Drive

Woodbury, NY 11797

Phone: 516-921-7100

Fax: 516-921-7920

## REQUEST FOR INFORMATION

No. 00013

**TITLE:** Grating Span

**DATE:** 8/26/2009

**PROJECT:** BNL CCWF-II

**JOB:**

**TO:** Attn: Allan Raphael  
Brookhaven National Laboratory  
Brookhaven Sciences Associates, LLC  
Project Modernization Office  
Upton, NY 11973-5000  
Phone: 631-344-5854

**STARTED:**

**COMPLETED:**

**REQUIRED:** 9/2/2009

August 26, 2009

Grating Span

**SC-102**

Detail 102B/**SC-120** indicates 1-1/4 x 3/16" grating to span 6'-0". According to our supplier this type of grating is only acceptable for a span less than 5'-6". Please Clarify.

CC: File

### ANSWER:

**Requested By:** E.W. Howell Co., LLC

**Date:**

8/26/09

**Signed:** Lauren Bergin  
Lauren Bergin

1 1/4" x 3/16" grating can span 6 feet, with a maximum distributed load of 164 psf with a deflection of 0.536", and a concentrated load of 493 lbs with a deflection of 0.429". See attached load table. This is more than adequate for the intended use, which is to hold pedestrian load or the load of an operator.

S. Muddappa  
Giffels Partnership  
08-26-09



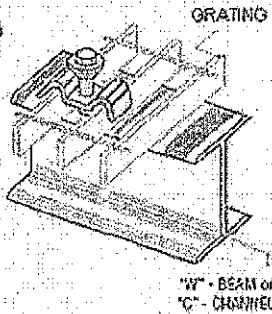
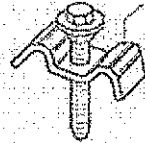


## B Fastening Methods

### TYPE "D" CLIP FOR TYPE 10 & TYPE 15 GRATING ONLY

1/4" (6MM) SELF-TAPPING SCREW

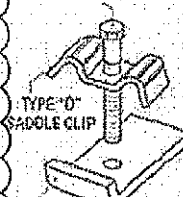
TYPE "D" SADDLE CLIP



GRATING

"W" - BEAM or  
"C" - CHANNEL

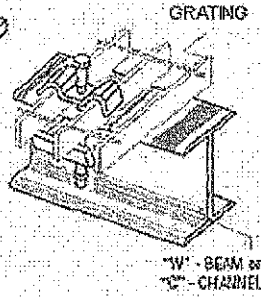
5/16" (8MM) HEX HEAD BOLT



TYPE "D" SADDLE CLIP

TYPE "D" LOWER CLAMP

5/16" (8MM) HEX NUT



GRATING

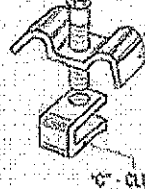
"W" - BEAM or  
"C" - CHANNEL

### TYPE "C" CLIP ASSEMBLY

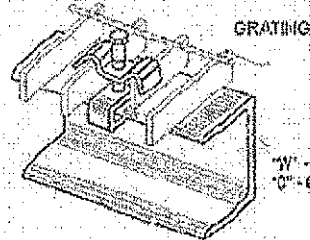
CAN BE INSTALLED TOTALLY FROM  
ABOVE THE GRATING.

5/16" (8MM) HEX HEAD BOLT

TYPE "D" SADDLE CLIP



"C" - CLIP

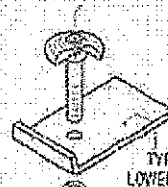


GRATING

"W" - BEAM or  
"C" - CHANNEL

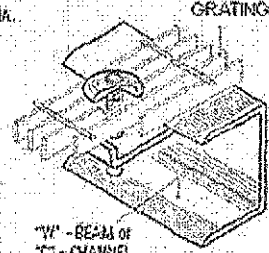
### TYPE "B" CLIP FOR TYPE 11 & TYPE 9.5 GRATINGS ONLY

TYPE "B" CARRIAGE BOLT



TYPE "D" LOWER CLAMP

3/8" (10MM) DIA.  
HEX NUT



GRATING

"W" - BEAM or  
"C" - CHANNEL

**LOAD TABLE**  
**STEEL GRATING**

**LOAD TABLE FOR STEEL GRATING - TYPE W-19**

F=18,000psi, E=29,000,000psi

(For ASTM A 1011/A 1011M SS GR36 Type 1, F=20,000psi and tabular values for U, C, and D shall be multiplied by 1.11)

Bearing Bar Size (in)	Nominal Weight (psf)**	Recommended max. span (in.) for 1/4 in. deflection under uniform load of 100psf	U=uniform load, psf D=deflection, in. C=concentrated load at mid-span, lb per foot of grating width	Span in Inches													
				24	30	36	42	48	54								
				355	227	158	116	89	70								
3/4x1/8	42	[4]	U	355	227	158	116	89	70								
			Du	0.099	0.155	0.223	0.304	0.397	0.503								
			Dc	0.079	0.124	0.179	0.243	0.318	0.402								
3/4x3/16	46	[6]	U	533	341	237	174	133	105								
			Du	0.099	0.155	0.223	0.304	0.397	0.503								
			Dc	0.079	0.124	0.179	0.243	0.318	0.402								
1x1/8	51	[6]	U	632	404	281	206	158	125	101	84	72	60	466	0.563	0.670	
			Du	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670	0.372	0.451	0.536		
			Dc	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.372	0.451	0.536		
1x3/16	57	[8]	U	947	606	421	309	237	187	152	125	105	78	466	0.563	0.670	
			Du	0.074	0.116	0.168	0.228	0.298	0.377	0.466	0.563	0.670	0.372	0.451	0.536		
			Dc	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.372	0.451	0.536		
1-1/4x1/8	61	[7]	U	987	632	439	322	247	195	158	130	110	93	466	0.563	0.670	
			Du	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730	0.842		
			Dc	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584	0.669	0.754	
1-1/4x3/16	67	[9]	U	1480	947	658	483	370	292	237	196	164	140	121	101	89	79
			Du	0.060	0.093	0.134	0.182	0.238	0.302	0.372	0.451	0.536	0.629	0.730	0.842	0.957	1.072
			Dc	0.048	0.074	0.107	0.146	0.191	0.241	0.298	0.360	0.429	0.504	0.584	0.669	0.754	0.842
1-1/2x1/8	70	[8]	U	1421	909	632	464	355	281	227	188	158	135	116	101	89	79
			Du	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.698	0.794	0.897
			Dc	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.559	0.636	0.718
1-1/2x3/16	77	[11]	U	2132	1364	947	696	533	421	341	282	237	202	174	152	133	118
			Du	0.050	0.078	0.112	0.152	0.199	0.251	0.310	0.376	0.447	0.524	0.608	0.698	0.794	0.897
			Dc	0.040	0.062	0.089	0.122	0.159	0.201	0.248	0.300	0.358	0.420	0.487	0.559	0.636	0.718
1-3/4x3/16	87	[13]	U	2901	1857	1289	947	725	573	464	384	322	275	237	206	181	161
			Du	0.043	0.067	0.096	0.130	0.170	0.215	0.266	0.322	0.383	0.450	0.521	0.599	0.681	0.769
			Dc	0.034	0.053	0.077	0.104	0.136	0.172	0.213	0.257	0.306	0.360	0.417	0.479	0.545	0.615
2x3/16	96	[14]	U	3789	2425	1684	1237	947	749	606	501	421	359	309	269	237	210
			Du	0.037	0.058	0.084	0.114	0.149	0.189	0.233	0.282	0.335	0.393	0.456	0.524	0.596	0.673
			Dc	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.419	0.477	0.538
2-1/4x3/16	105	[16]	U	4796	3069	2132	1566	1199	947	767	634	533	454	392	341	300	266
			Du	0.033	0.052	0.074	0.101	0.132	0.168	0.207	0.250	0.298	0.350	0.406	0.466	0.530	0.598
			Dc	0.026	0.041	0.060	0.081	0.106	0.134	0.166	0.200	0.238	0.280	0.324	0.372	0.424	0.478
2-1/2x3/16	113	[18]	U	5921	3789	2632	1933	1480	1170	947	783	658	561	483	421	370	328
			Du	0.030	0.047	0.067	0.091	0.119	0.151	0.186	0.225	0.268	0.315	0.365	0.419	0.477	0.538
			Dc	0.024	0.037	0.054	0.073	0.095	0.121	0.149	0.180	0.215	0.252	0.292	0.335	0.381	0.431

All loads and deflections shown are based on engineering computations using gross sections and nominal sizes of bearing bars. The values listed are for design selection only and are not intended to be "absolute" since actual load capacity will be affected slightly by variations which can be expected due to material and manufacturing tolerances.

*Note: The carrying capacity of a piece of grating subjected to a concentrated load over only a portion of its width is determined by the stiffness of both the bearing bars and the cross bars, and therefore differs with the type of grating used. To determine the carrying capacity of gratings subject to such loadings, the manufacturer's engineering department should be consulted.*

**Conversion Factors:**

For gratings with other than 1-3/16" bearing bar spacing, or for different design stresses, proportionate conversion factors apply. Refer to the Metal Bar Grating Engineering Design Manual for the development of such factors.

*Note: 1/4" is considered the maximum deflection consistent with pedestrian comfort, but can be exceeded for other loading conditions at the discretion of the engineer.*

**NOTE: For serrated grating, the depth of grating required for a specified load is 1/4" greater than in the table.**

\*\*Weights (mass/area) shown are approximate and vary with manufacturers. They are provided for preliminary design computations only and are not intended for any other purpose.